**User's Guide**
**Bedienungsanleitung**
**Mode d'emploi**
**Manuale d'uso**
**Manual del usario**

# REF-METER-OCTA

- **Electronic charging scale**
- **Elektronische Füllwaage**
- **Appareil de charge électronique**
- **Bilancia elettronica**
- **Balanza electronic**

HVAC/R
Service Products

REFCO

REFCO Manufacturing Ltd.
Industriestrasse 11
CH-6285 Hitzkirch (Switzerland)

Telefon +41 41 919 72 82
Telefax +41 41 919 72 83
info@refco.ch www.refco.ch

## Introduction

Thank you for your purchase of the Refco REF-METER-OCTA Digital Charging Scale. The REF-METER-OCTA is the most accurate and precise refrigerant meter available today with features that cannot be found anywhere else. It is ideal for HVAC and Refrigeration service, including Critical Charging of small refrigeration systems.

With the REF-METER-OCTA, you can measure weight in both kgs and lbs units. The REF-METER-OCTA is programmable, and has a built in alarm to indicate a programmed threshold has been exceeded. Attaching the REF-METER-OCTA to the REF-METER-PLUS allows automatic refrigerant charging for A/C systems.

## Features

- Large, high-visibility LCD display
- Measures weight in kgs, lbs and oz
- Built-in memory remembers all previous settings
- Refrigerant Tank Capacity Indicator
- Rugged, Compact Design
- Long Battery Life
- High Accuracy and Resolution
- Programmable
- Can be calibrated in the field with inexpensive reference weights
- Thread for mounting 10612-REF for liquid filling and charging of refrigerants cans
- Expandable with REF-METER-PLUS

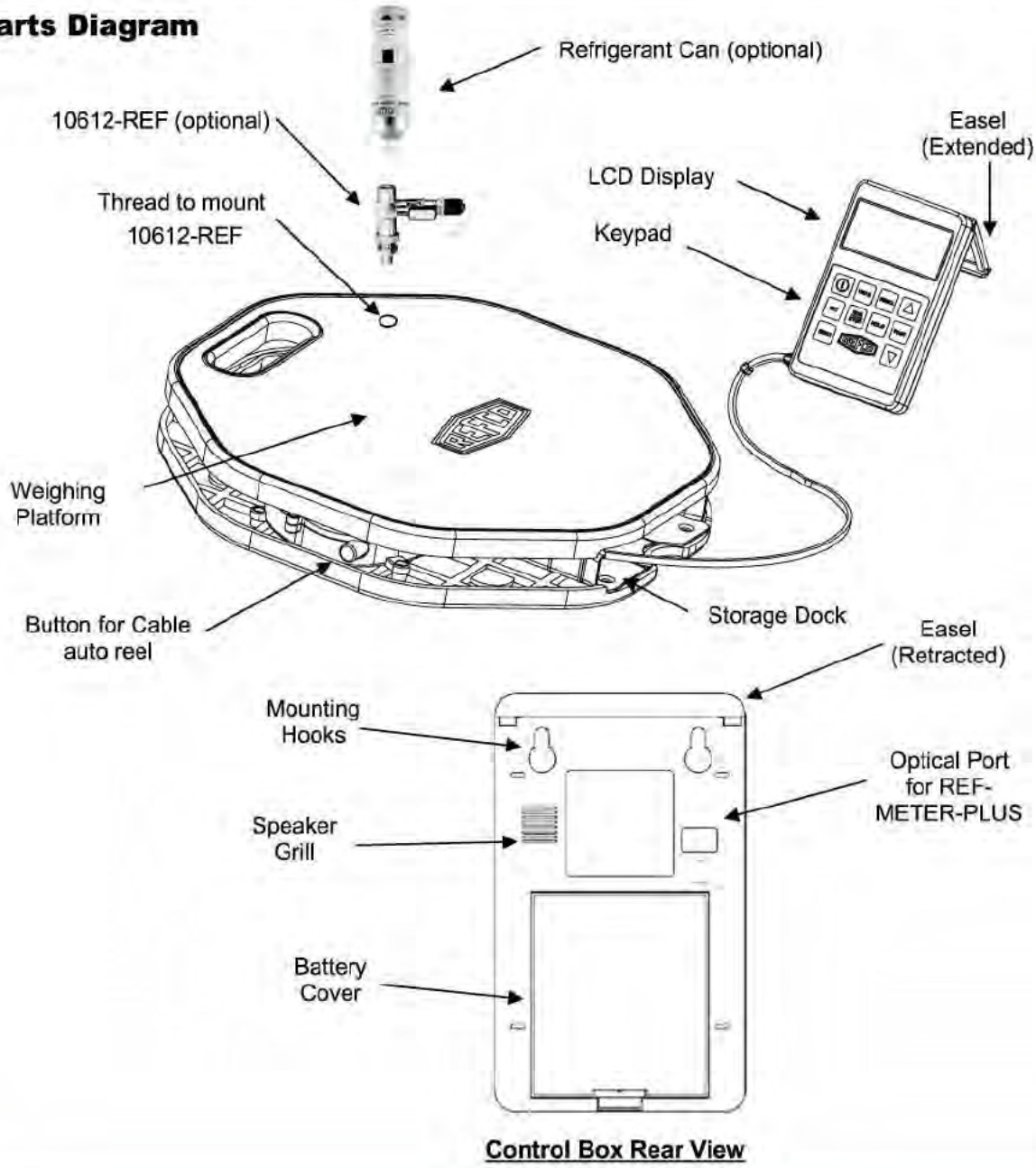
CE

## Specifications

| | |
|---|---|
| Capacity | 100 kilograms (220 Pounds) |
| Accuracy | 0.5% of Reading +/- 1 Least Significant Digit |
| Resolution | 2g, 0.005 lbs., 0.1 oz. |
| Power | 4 x 1.5V 'AAA' Alkaline Batteries (6 VDC) |
| Battery Life | 30 hours continuous use |
| Operating Temperature | 10C – 40C (50F – 104F) |
| Weight | 3.0 kg (6.6 lbs.) |
| Dimensions | 30.5 cm x 30.5 cm x 5 cm (12.0" x 12.0" x 1.96") |

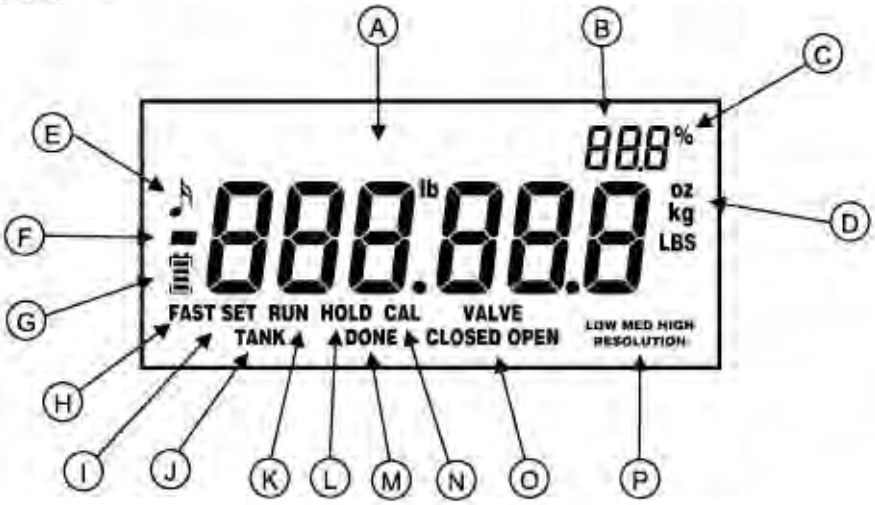
**NOTE:** To prevent damage, never exceed the rated capacity of the REF-METER-OCTA.

## Parts Diagram



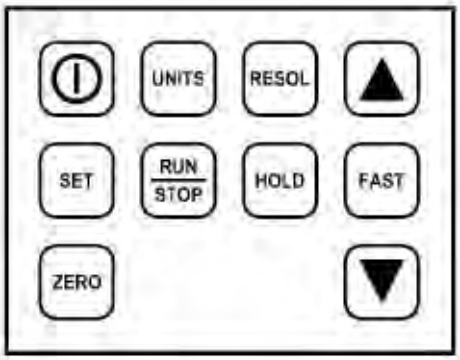

**Control Box Rear View**

## LCD Display




| Item | Function |
|---|---|
| A | Main Numeric Display |
| B | Alternate Numeric Display |
| C | Tank Capacity Percent Indication |
| D | Units Indicators |
| E | Sound Mute Indicator |
| F | "Floating" Negative Indicator (Indicates weight removed from platform) |
| G | Battery Level Indicator |
| H | Fast Adjustment Indicator |
| I | Set Mode Indicator |
| J | Tank Capacity Mode Indicator |
| K | Run Mode Indicator |
| L | Hold Mode Indicator |
| M | Program Complete Indicator |
| N | Calibration Mode Indicator |
| O | Valve Open/Closed Indicator for use with REF-METER-PLUS |
| P | Resolution Indicator |

## Keypad




| | |
|---|---|
| ⏻ | Press for power-on, press/hold for power off. |
| UNITS | Press to cycle through displayed units. |
| RESOL | Press to select low, medium, or high display resolution. |
| ZERO | Press to "zero-out" current reading on display. |
| ▲ ▼ | Use to adjust various settings and programming values. |
| FAST | For faster adjustments. Used in conjunction with ▲ and ▼. |
| HOLD | "Freezes" display. |
| SET | Starts programming mode |
| RUN STOP | Activates / Deactivates stored program. |

## Quick Start

To operate the REF-METER-OCTA as a basic weigh scale, perform the following steps:

### Setup

1. Unpack the scale as described in the "Unpacking the REF-METER-OCTA" section below.
2. Install the batteries into the control box as described in the "Battery Installation" section below.
3. Place the Weighing Platform on a firm, level surface.
4. Turn the REF-METER-OCTA on by pressing ⏻.
5. Select the proper measurement units by repeated pressing UNITS. The units will cycle as follows:
   kilograms ⇨ pounds ⇨ pounds and ounces ⇨ ounces
6. Select the desired display resolution by repeatedly pressing RESOL as described in the RESOLUTION section.

### Basic Weighing Operation

1. If using a container to hold the objects being measured, place it empty on the center of the platform.
2. Press ZERO to "zero-out" the scale. The display will read zero.
3. Place the material to measure in the container or on the center of the platform.
4. Read the weight on the display.
5. A positive number indicates the applied weight is greater than the zero value. A negative number indicates the applied weight is less than the zero value.
6. Repeat steps 1 through 5 as necessary.
7. Turn the REF-METER-OCTA off by pressing and holding ⏻ down until the scale turns off.
8. To conserve battery life, the REF-METER-OCTA will turn itself off after 30 minutes of inactivity, unless it is currently running a program (see Programming section). The last state of the REF-METER-OCTA will be restored upon power-up.

## Unpacking the REF-METER-OCTA

1. Remove the REF-METER-OCTA from the carry bag.
2. Push the signed part of the control box to remove it from the storage dock. The storage dock is placed on the low side of the weighing platform.
3. Pull out the control box from the storage dock. When using the REF-METER-OCTA, ensure the cable does not touch the top of the weighing platform to avoid inaccuracies.
4. If desired, extend the easel at the top back of the control box by pulling it out. The easel may be used straight for hanging, or folded at an angle for resting on a level surface.

### Repacking the REF-METER-OCTA

1. If extended, restore the easel of the control box to the retracted position.
2. Hold the control box and press the yellow auto reel button on the side of the platform.
3. Push the control box firmly into the storage dock of the weighing platform until it snaps in place.
4. Replace the REF-METER-OCTA into the carry bag.

## Battery Installation & Replacement

1. Remove the battery cover from the rear of the control box by compressing tab at the base of the battery cover.
2. If necessary, remove old set of batteries.
3. Insert 4 'AAA'. Replace battery cover by aligning tabs and snapping back into place.

**IMPORTANT: TO PREVENT DAMAGE TO THE REF-METER-OCTA, CAREFULLY OBSERVE BATTERY POLARITY AS MARKED INSIDE THE BATTERY COMPARTMENT. DO NOT LEAVE DEAD BATTERIES INSIDE THE CONTROL BOX. REMOVE BATTERIES IF THE REF-METER-OCTA IS NOT TO BE USED FOR AN EXTENDED PERIOD OF TIME.**

## Resolution

The resolution (minimum incremental weight or volume) than can be displayed by the REF-METER-OCTA can be adjusted to make the display easier to read. Unstable loads or high winds can cause the display to fluctuate erratically. By reducing the display resolution, external influences can be minimized. As shipped, the REF-METER-OCTA is set to MEDIUM resolution, suitable for most purposes. The resolution can be changed to LOW, MEDIUM or HIGH by repeated pressing RESOL on the keypad. The table 1 illustrates the displayed resolution for each units mode vs. resolution. Regardless of the resolution setting, the scale operates internally with the highest resolution; therefore, only the displayed value is affected.

| | Units | | | |
|---|---|---|---|---|
| **Resolution** | **Kilograms** | **Pounds** | **Pounds & Ounces** | **Ounces** |
| HIGH | 2 g | 0.005 lbs | 0.1 oz. | 0.1 oz. |
| MEDIUM | 5 g | .0.010 lbs. | 0.2 oz. | 0.2 oz. |
| LOW | 10 g | 0.020 lbs. | 0.5 oz. | 0.5 oz. |

**TABLE 1.** Resolution Settings

### Over Range Indication

If the weight applied to the weighing platform exceeds the maximum capacity of the REF-METER-OCTA (100 kg), a single "1" will be shown on the left side of the display. To prevent damage to the REF-METER-OCTA, immediately remove the weight from the platform.

### Hold Mode

A special feature of the REF-METER-OCTA allows the emptying or replacing bins or containers used for weighing without affecting the weight shown on the display. This Hold Mode may be used as follows:

1. Allow load to settle until display is steady.
2. Press HOLD. The current weight is now locked on the display.
3. Remove, empty, or replace objects, bins, or containers on the platform.
4. Wait 5 seconds for the new load to stabilize.
5. Press HOLD. Measurements will continue from where they left off prior to initiating Hold Mode.

### Programming

With the REF-METER-OCTA, a programmable threshold weight will sound an alarm. The alarm will sound when the displayed weight (either positive for increasing weight, or negative for decreasing weight) equals the programmed weight. To program the alarm, perform the following steps:

1. Set up the REF-METER-OCTA with the desired units and resolution as described in the Quick Start Setup section above.
2. If measuring decreasing weight, place the objects or container with the objects or material that will be removed on the weighing platform.
3. Press SET to start the SET Mode, indicated by the SET enunciator on the LCD display.
4. Press and/or hold the ▲ or ▼ keys to set the desired alarm set point. Ref To change the set point faster, press FAST. This will activate the FAST SET mode which will change the set point 10x faster than normal. Press FAST again to return to the normal speed SET mode.

5. Press RUN/STOP. The display will automatically change to zero and the RUN indicator will show to indicate that the program is running.
6. When the applied (or removed) weight exceeds the programmed amount, the alarm will sound and the DONE indicator will flash on the display.
7. Press any key to stop the alarm.
8. To cancel the RUN mode at any time, press the RUN/STOP key.

**NOTE:** *The RUN mode can only be initiated from the SET mode. If you cancel the RUN mode by pressing* RUN/STOP*, and wish to RUN again, press* SET *(the previous set point will be restored) followed by* RUN/STOP *again. The display will be zeroed when the program restarts. You may program the SET mode without starting the RUN mode by pressing* SET *after setting the program set point. The new value will be saved until next time the SET mode is activated.* HOLD *can be used during the RUN mode similarly as described in the HOLD MODE section. The* REF-METER-PLUS *provides additional functionality when using the RUN mode. Refer to the* REF-METER-PLUS *User's Guide for details.*

### Tank Capacity Mode

It is often convenient to know the relative amount of material (i.e. refrigerant) remaining in a container (tank). The REF-METER-OCTA's Tank Capacity Mode allows a continuous display of the percentage of material remaining in a tank. In order to compute the percentage accurately, the REF-METER-OCTA must be trained to know the weights of an empty and full tank. To train the REF-METER-OCTA Tank Capacity Mode, perform the following steps:

## Tank Capacity Mode Training

1. While holding ZERO down, press SET. The SET TANK indicator will turn on, and OFF will show on the display. This indicates that the Tank Capacity Mode is currently off.
2. Turn the Tank Capacity Mode on by pressing ▲. The display will show ON, and the Alternate Numeric Display and Percent Indicator will turn on.
3. Press SET to proceed to the first step of training. 0% will flash in the Alternate Numeric Display indicating that the weight of an empty container must be registered.
4. Apply an empty container (or a load representing the weight of an empty container) on the platform. Wait 5 seconds for the load to stabilize, then press SET. 100% will flash in the Alternate Numeric Display indicating that the weight of a full container must be registered.
5. Apply a full container (or a load representing the weight of a full container) on the platform. Wait 5 seconds for the load to stabilize, then press SET. This completes the training process, and the SET TANK indicator will turn off.
6. From this point forward, the Alternate Numeric Display will show the percent of material remaining in the container from 0% to 100%.

**NOTE:** *The 100% weight must be larger than the 0% weight by at least 200g. If not, "**Err**" will show on the Alternate Numeric Display. To clear the error, retrain as above using a 100% weight that is at least 200g larger than the 0% weight. During training, the ZERO key may be used to assist in setting the 0% and 100% values. This will have no effect on the training, as the Tank Capacity Mode relies on absolute, not relative, weights.*

Perform the following steps to turn the Tank Capacity Mode Off:

**Turning Tank Capacity Mode Off**

1. While holding ZERO down, press SET. The SET TANK indicator will turn on, and ON will show on the display. This indicates that the Tank Capacity Mode is currently on.
2. Turn the Tank Capacity Mode off by pressing ▼. The display will show OFF, and the Alternate Numeric Display will turn off.
3. Press RUN/STOP to return to normal operation.

The Tank Capacity Mode can be turned back on without retraining. The REF-METER-OCTA will remember the previous 0% and 100% set points until the unit is re-trained as above. To turn the Tank Capacity Mode on without re-training, perform the following steps:

**Turning the Tank Capacity Mode On without Re-training**

1. While holding ZERO down, press SET. The SET TANK indicator will turn on, and OFF will show on the display. This indicates that the Tank Capacity Mode is currently off.
2. Turn the Tank Capacity Mode on by pressing ▲. The display will show ON, and the Alternate Numeric Display and Percent Indicator will turn on.
3. Press RUN/STOP to return to normal operation.

## Battery Level Indicator

The battery level indicator shows the relative strength of the batteries. Full power is indicated by four bars. As the batteries are depleted, the number of bars displayed decreases, until no bars are left. At this point, it is necessary to replace the batteries (refer to the Battery Installation section above). If the battery power drops to the point where the REF-METER-OCTA can no longer function accurately, the power will turn off automatically. When the batteries are replaced, and the scale is turned back on, the REF-METER-OCTA will resume operation with all previous setting intact.

## Calibration

The REF-METER-OCTA is calibrated at the factory to provide high accuracy. While recalibration should seldom, if ever, be necessary, recalibration is performed easily without sending the product to the manufacturer for service. A known calibration weight (in kilograms) is required to recalibrate the scale, and can be any value between 5 kg and 100 kg. 25 kg is recommend. Best accuracy is obtained by using the largest weight available (i.e. a 50 kg calibration weight will provide better calibration accuracy than a 5 kg calibration weight). In addition, it is necessary to know the weight to within 2 grams.

To recalibrate the REF-METER-OCTA, perform the following steps:

1. Place the REF-METER-OCTA weighing platform on a firm, level surface.
2. Turn the power to the REF-METER-OCTA off.
3. Remove all objects from the platform.
4. While holding [SET], press and release [⏻]. The REF-METER-OCTA will turn on, and after a few seconds the display will show SET CAL and 25.000 kg.
5. Using [▲] or [▼] adjust the displayed value (in 1g increments) so that it is equal to the weight of the reference calibration weight. Use the [FAST] key to adjust in 1 kg increments.
6. Press [SET]. A number representing the weight of the unloaded platform will appear on the display. Press [ZERO] to lock in this value. The display will read zero.
7. Apply the calibration weight to the platform. A number representing the applied reference weight will appear on the display. Allow at least 10 seconds for this number to stabilize.
8. Press [SET]. The REF-METER-OCTA is now recalibrated to the reference weight.
9. Refer to the Quick Start section above for setting the desired Units and Resolution.

## Restoring Factory Calibration

If you make a mistake recalibrating the REF-METER-OCTA, you can always restore the factory calibration (and factory defaults) of the scale.

To restore the factory settings perform the following steps:

1. Turn the power to the REF-METER-OCTA off.
2. Remove any objects from the platform.
3. While holding RUN/STOP, press and release ⏻. The REF-METER-OCTA will turn on and beep 10 times. The factory settings are now restored.
4. Refer to the Quick Start section above for setting the desired Units and Resolution.

## Sound

As delivered from the factory, the REF-METER-OCTA beeps when turning on and when keys are pressed. This sound can be muted as follows:

1. Make sure the power is on.
2. While holding ZERO, press ⏻. The musical symbol on the left of the display will turn off to indicate that the sound has been muted.

Repeat steps 1 and 2 to turn the sound back on.

**NOTE:** *The Mute function only affects the power-on and key-press beeps. It has no effect on the alarm.*

## HVAC Service

Because of its high stability and accuracy, the REF-METER-OCTA is ideal for automotive, commercial, and residential A/C refrigerant charging and recovery. Its high resolution also allows accurate critical charging of small refrigeration systems such as commercial freezers.

To use the REF-METER-OCTA for refrigerant charging, perform the following steps:

1. Press [UNITS] to set the desired display units.
2. If desired, set up the Tank Capacity Mode as described in the Tank Capacity Mode section. This will allow you to know at any time the percent of refrigerant remaining in the refrigerant cylinder.
3. Carefully set the refrigerant cylinder on the weighing platform.
4. Attach the cylinder to the charging manifold via a utility hose. Open the cylinder valve and purge air from the hose.
5. Program the desired refrigerant charge weight as described in the Programming section. Activate the program by pressing [RUN/STOP].
6. Open the manifold valve(s).
7. The display will indicate the weight charged as negative, indicating refrigerant is being removed from the charging cylinder.
8. If the refrigerant cylinder empties while charging:
    a. Close all valves.
    b. Press [HOLD] to "freeze" the display (as described in the Hold Mode Section).
    c. Replace the empty refrigerant cylinder with a full one. Attach and purge hoses.
    d. Press [HOLD] to exit the Hold Mode.
    e. Open manifold valve(s). Charging will continue from where it left off.
9. When charging is complete, the alarm will sound. Close all valves and press any key to cancel the alarm.